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REPORT ON THE APPLICATION FOR A PERMIT AUTHORIZING THE REMOVAL OF PROPANE FROM THE PROVINCE OF HOME OIL COMPANY LIMITED UNDER THE GAS RESOURCES PRESERVATION ACT, 1956

AUGUST 1966

OIL AND GAS CONSERVATION BOARD
603 SIXTH AVENUE SOUTH WEST • CALGARY, ALBERTA

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I INTRODUCTION

This report deals with the application by Home Oil Company Limited (hereinafter called "Home"), made pursuant to The Gas Resources Preservation Act, 1956, and asking authority to remove propane from the Province. The application was heard by the Oil and Gas Conservation Board on March 22, 1966. Mr. M. E. Lomas represented Home.

Home applied for a permit authorizing it to remove from the Province propane produced, purchased or otherwise acquired in the Carstairs Field and the Crossfield Field at the rate of 492,750 barrels per year during a twenty-year period to commence on March 1, 1967.

An application by Canadian Hydrocarbons Limited, the holder of Permit No. CH 65-1, in which it asked that this permit be amended to authorize it to remove propane produced from the Carstairs Field and the Waterton Field over a period of twenty years, was heard at the same sittings. In July Canadian Hydrocarbons withdrew its application by letter to the Board.

Qualification of Applicant

Home made its application as a person qualified to apply under section 5, subsection (1) of The Gas Resources Preservation Act, 1956. It submitted evidence that it is the operator of the Carstairs-Crossfield Plant at which the propane it proposes to remove from the Province will be extracted. When such propane is extracted, Home will be the owner of part of it, and is the exclusive agent to sell the propane for those who will own the balance of the propane referred to in the application. The Board believes Home has the qualifications to make an application.

Date of Reserve Assessment and Period of Protection

In preparing the supply-demand balance study in its application, Home adopted the Board's forecasts of propane production and Alberta requirements of propane which appeared in the report OGCB 66-A(1). The reserve assessment in that report reflected the Board estimate of propane reserves as of December 31, 1964. The Board has now completed a more recent reserve study and is able in this report to use its assessment of propane reserves as of February 28, 1966.

The period over which the Board has assessed the requirements of the Province is still 1966 to 1995 inclusive.

Intervener

The British American Oil Company Limited registered as an intervener but did not participate further. Mr. W. M. Winterton appeared for British American.

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(1) Report on the Application regarding the Removal of Propane from the Province by Pacific Petroleums Ltd. under The Gas Resources Preservation Act, 1956. January, 1966.

II SUBMISSION OF HOME OIL COMPANY LIMITED

Home Oil Company Limited applied to the Board for a permit authorizing it to remove from the Province propane to be produced at the Carstairs plant. The plant processes gas produced from both the Carstairs Field and the Crossfield Field. The applicant asked that the permit specify that, during the twenty-year period commencing March 1, 1967, Home may remove,

(a) a daily average of 1,350 barrels of propane per day,
(b) 492,750 barrels of propane annually, and
(c) 9,855,000 barrels of propane during the term of the permit.

The volumes applied for represent Home's share of the propane to be produced from the plant plus the share of other owners who have granted Home the exclusive right to market their share of the production. At the time of the hearing, a market for the propane had not been obtained, but negotiations were continuing.

The propane which is the subject of this application is now left in the residue gas stream and is being removed by Pacific Petroleums Ltd. at the Empress plant.

Home presented an estimate of the volumes of propane expected to be produced at the Carstairs plant. It estimated that during the proposed twenty-year term of the permit requested an average of 1,130 barrels per day would be produced from the Carstairs Field and 1,300 barrels per day from the Crossfield Field, or a total of 2,430 barrels per day from the plant. Of this total production, Home owns or has the right to market 1,228 barrels per day.

Home based its application for 1,350 barrels per day, being 110 per cent of 1,228, on the recent practice of the Board of granting a permittee authority to remove 110 per cent of the volumes of propane owned or controlled by the permittee.

Reserves and Availability of Propane

The applicant did not make an estimate of the reserves or deliverability of propane in Alberta, nor did it forecast the requirements for propane of persons in the Province. Home adopted, with some modifications, the estimates presented by the Board in its most recent report on these matters, OGCB 66-A(1).

Home adopted the Board's estimates of production and Alberta's requirements for the twenty-year period 1967 to 1986. It reduced the authorization granted to Pacific Petroleums Ltd. by 760 barrels per day, being Home's estimate of the amount of propane the permittee recovers from that portion of the Carstairs plant residue gas stream owned by Home or by the other producers on whose behalf Home will market propane. The applicant added to the Provincial permit commitments, the volumes recently granted to The British American Oil Company Limited and the additional volumes applied for by Canadian Hydrocarbons Limited.

Incorporating the above modifications into the Board's forecasts results in a surplus varying from a balanced position to 10,500 barrels per day during the term of the requested permit. Subtracting from the surplus the volumes applied for by Home produces a surplus of from 1,000 to 9,000 barrels per day during the period 1967 to 1982. A deficiency results in 1983 of some 500 barrels per day increasing to about 1,300 barrels per day during each of the remaining three years of the twenty-year period.

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(1) Report on the Application regarding the Removal of Propane from the Province by Pacific Petroleums Ltd. under The Gas Resources Preservation Act, 1956. January 1966.

Although the analysis indicates a deficiency during the last four years of the term of the proposed permit, Home contended that its application should be granted in full because any permit issued by the Board contains a clause protecting the consumers in the Province. Home was referring to the clause which reads:

"The Permittee shall supply propane at a reasonable price to any community or consumer within the Province that is willing to take delivery of propane at the gas processing plant, and that, in the opinion of the Board, can reasonably be supplied by the Permittee.

In the event that propane is removed from the Province pursuant to this Permit by pipe line, the Permittee shall supply propane at a reasonable price to any community or consumer within the Province that is willing to take delivery of propane at a point on the pipe line transmitting the propane within the Province, and that, in the opinion of the Board, can reasonably be supplied by the Permittee."

By using figures previously published by the Board, Home illustrated that at the end of 1986 when the permit applied for would terminate there would be 147 million barrels of propane available to meet the remainder of Alberta's thirty-year requirements of 89 million barrels. After satisfying this requirement, the permit commitments and the volumes applied for by itself and Canadian Hydrocarbons Limited, a surplus of 58 million barrels is indicated at the end of 1996.

Based on its analysis of the availability and requirements for propane, the applicant submitted that the volume of propane it proposes to remove from Alberta is surplus to the present and future needs of persons within the Province and to the quantities of propane required to meet existing and applied for permits, and that its removal will be in the public interest.

III BASIS OF CONSIDERATION

Agency Agreements

The volumes of propane, for the removal of which Home asked a permit, were classified according to ownership in two categories: propane belonging to Home, and propane belonging to other owners who had appointed Home their agent to market the propane. In its submission, Home produced the form of the agreements under which it was appointed agent of other owners. The agreements give Home the exclusive right to negotiate sale of the other owners' propane and butane until January 1, 1969, and thereafter until such right is terminated as provided in the agreements.

(1) Views of the Board

An instance of an application by a sales agent of the owner has not arisen in connection with gas removal permits. However, some instances where a processing plant operator has an exclusive right entitling it to dispose of another owner's liquid products have appeared lately. The position of such an agent under The Gas Resources Preservation Act, 1956, was clarified by the amendment this year of section 5(1) as a result of which a person who has made an arrangement giving him the exclusive right to dispose of gas or propane is as qualified to apply for a permit as one who has made an arrangement to purchase the gas or propane.

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(1) Statutes of Alberta, 1966, c.34, s. 2.

The provision of the agency contracts, whereby they are in force until January 1, 1969, and will continue thereafter until terminated, makes such contracts analogous to the open-end contracts discussed in OGCB Report 66-B(2). In absence of evidence that an agency contract with this provision will be terminated, the Board is prepared to accept the contract as being for the term of the proposed permit, but subject to the condition that, whenever notice of termination of such a contract is given, the permittee shall promptly advise the Board and, unless the permittee shows that he has become owner of, or the exclusive agent of the owner of, replacement volumes, the permit volumes shall be reduced accordingly.

Relationship of Volumes Owned or under Contract to Permit Volumes

The rules which the Board is prepared to apply in determining the permit volumes from the volumes of propane which an applicant owns or has under contract were enunciated in OGCB Report 65-11(3) and were slightly modified in OGCB Report 66-B.

The rules which are of particular interest in considering the subject application are that which states that where the permittee does not have the full volumes applied for under contract, the permit volumes for the third and subsequent years of the term of the permit shall be 110 per cent of the volumes for such years owned or under contract, and that which would allow a permittee, whose contract volumes were insufficient for the full volumes applied for, to file additional contracts within twenty-one months as a basis for increasing the volumes for the third and subsequent years.

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(2) Report on the Applications regarding the Removal of Propane from the Province by The British American Oil Company Limited under The Gas Resources Preservation Act, 1956. March 1966.

(3) Report on the Applications for Permits authorizing the Removal of Propane from the Province of Canadian Hydrocarbons Limited and The British American Oil Company Limited under The Gas Resources Preservation Act, 1956. September 1965.

As is set out in Appendix D, it is anticipated that in the later years of the term of the permit applied for there will be a decline in the production of propane at the Carstairs gas processing plant. The volumes owned by or under contract to Home, after increase in accordance with the 110 per cent rule, will amount, in the last three years of the proposed term, to 1,260, 1,120 and 970 barrels per day, being less than the 1,350 barrels per day applied for. The permit volumes for the last three years will decline accordingly.

The Board does not consider that inclusion of a provision for the filing of additional contracts would be useful in a permit that might be granted on the subject application. The deficiencies in volume are relatively small and are not expected until 1984. In these circumstances, the later year deficiencies are not as much a matter of lack of contracts as one of difference of opinion as to future propane production at the plant.

IV FINDINGS

The Board having heard publicly the application under The Gas Resources Preservation Act, 1956, of Home Oil Company Limited and having studied the evidence submitted by the applicant at the public hearing of the application, and having regard to the advice of its staff, to its own knowledge, and to its responsibility under the Act, finds as follows:

1. IN THE MATTER OF THE RECOVERABLE RESERVES AND THE YEAR BY YEAR AVAILABILITY OF PROPANE IN ALBERTA

The Board estimates the total recoverable reserves of propane in Alberta as of February 28, 1966, to be some 441 million barrels, of which some 386 million barrels will be recovered from existing processing plants and some 55 million barrels will be recovered by more complete processing of gas if there is sufficient demand for propane. The corresponding estimates made in March, 1966, and presented in OGCB Report 66-B are some 398, 334 and 64 million barrels respectively.

The Board estimates the production of propane from existing and Board approved processing plants will be approximately 31,000 barrels per day in 1966, will range from some 37,000 to 41,000 barrels per day during the period 1967 to 1973 inclusive, and will then decline gradually to about 20,000 barrels per day by 1987. The Board further estimates that if there is sufficient demand for propane, additional recovery will occur at processing plants to be constructed in the future or by the installation of deep-cut recovery facilities at existing plants, in an amount of about 6,000 barrels per day commencing in 1970. Combining these two estimates gives a year by year availability of propane of some 31,000 barrels per day in 1966, 38,000 to 41,000 barrels per day for the period 1967 to 1969, about 47,000 barrels per day during the period 1970 to 1974, and thereafter volumes declining gradually to about 26,000 barrels per day by 1987.

Details of the evidence and the Board's estimates of reserves and year by year availability of propane are presented in Appendix A.

2. IN THE MATTER OF TRENDS IN EXPLORATION AND THE GROWTH OF RECOVERABLE RESERVES AND YEAR BY YEAR AVAILABILITY OF PROPANE IN ALBERTA

The Board's latest study of trends in the growth of gas reserves indicates a long term growth of 2.5 trillion cubic feet per year and a growth of 6.8 trillion cubic feet during the 26-month period, January 1, 1964, to February 28, 1966. The Board is confident that the Province may reasonably count on a two-year growth in gas reserves of 5.0 trillion cubic feet. The Board estimates that in addition to the propane reserves referred to in Finding 1, a recoverable reserve associated with the 5.0 trillion cubic feet of gas of some 60 million barrels is also available.

The Board expects that propane production from the 5.0 trillion cubic feet will commence in 1970 at a rate of some 1,300 barrels per day and will gradually increase to about

5,600 barrels per day by 1987. This production is in addition to that referred to in Finding 1.

Details of the evidence and the Board's estimates are presented in Appendix A.

3. IN THE MATTER OF THE PRESENT AND FUTURE REQUIREMENTS OF ALBERTA FOR PROPANE AND THE PRESENT PERMIT COMMITMENTS

The Board estimates the requirements of Alberta for propane for the thirty-year period, January 1, 1966, to December 31, 1995, to be some 221 million barrels. The present estimate is unchanged from that presented in OGCB Report 65-11, report OGCB 66-A and OGCB Report 66-B.

With the increase in the quantity of propane Pacific Petroleums Ltd. is authorized to remove under Permit No. PP 66-2, the termination on September 30, 1966, of Permit No. BA 65-1 and the quantity of propane The British American Oil Company Limited is now authorized to remove under Permit No. BA 66-2, the permit commitments adjusted to January 1, 1966, have increased to some 124 million barrels.

Details of the evidence and the Board's estimates of Alberta's requirements and the present permit commitments are presented in Appendix B.

4. IN THE MATTER OF THE MEETING OF THE 1966-1995 REQUIREMENTS OF ALBERTA TOGETHER WITH THE PRESENT PERMIT COMMITMENTS, AND THE RESULTING SURPLUS.

Having regard to the 386 to 441 million barrels of propane estimated to be recoverable from established gas reserves, the

60 million barrels of propane estimated to be recoverable from two years growth of gas reserves, the thirty-year requirements of Alberta of 221 million barrels of propane, and the permit commitments of 124 million barrels, the Board finds that there is an overall surplus of 101 to 156 million barrels of propane. The 101 million barrels is based on existing facilities and the 156 million barrels on future facilities.

The Board estimates that after providing for the annual requirements of Alberta and the permit commitments there will be a propane surplus, based on production from existing facilities, of 11,000 barrels per day in 1966 and that the surplus will decline gradually to about 200 barrels per day by 1984. A deficit of some 1,000 barrels per day is indicated for the years 1985 to 1987. If allowance is made for future processing facilities, the surplus during 1966, 1967, 1968 and 1969 is unchanged, but increases to some 14,000 barrels per day in 1970 and declines thereafter to about 5,000 barrels per day in 1987. As indicated in its previous propane reports, the Board places greater weight on the latter figures and is satisfied that the deficiencies indicated by restricting the analysis to existing facilities will not materialize.

The Board estimates that the reserves of propane in 1987, at the end of the term of the longest subsisting permit for the removal of propane, will be 142 million barrels with existing facilities and 155 million barrels including future facilities. Alberta's requirements for the remainder of the thirty-year period, 1988 to 1995, are some 79 million barrels, thus indicating a surplus above the requirements of the remainder of the forecast period, of 63 to 76 million barrels.

Details of the evidence and the Board's analysis of these matters appear in Appendix C.

5. IN THE MATTER OF HOME OIL COMPANY LIMITED'S APPLICATION FOR AUTHORIZATION FOR THE REMOVAL OF PROPANE AND THE SURPLUS WHICH WOULD RESULT IF A PERMIT IS GRANTED

The Board finds that if the Home application were granted, the overall reserves of propane surplus to the thirty-year requirements of the Province and the permit commitments would be some 91 million barrels based on existing facilities and 146 million barrels based on future facilities.

The Board finds that after providing for Alberta annual requirements, the permit commitments, and the volumes requested in the application, the year by year surplus of propane, based on production from existing facilities and including a two-year growth of gas reserves, would be 6,700 barrels per day in 1967 decreasing to 400 barrels per day in 1976. After the expiry in 1976 of Permit No. BA 66-2, the surplus increases to about 7,300 barrels per day in 1977 and thereafter decreases to 900 barrels per day in 1982. A deficit of up to 2,400 barrels per day would occur over the years 1983 to 1987. If allowance is made for future processing facilities, the surplus in 1967, 1968 and 1969 is unchanged, but would then increase to some 12,500 barrels per day in 1970, decreasing gradually thereafter to about 4,900 barrels per day by 1987. As in Finding 4, the Board places greater weight on these latter figures and is satisfied that the deficiencies indicated by the former figures would not materialize.

Should the application be granted, the reserves remaining in 1987 at the end of the term of the longest subsisting permit for the removal of propane, and the surplus over the remaining thirty-year requirements of Alberta and the subsisting permit commitments, would be unchanged from the 142 to 155 million barrels of reserves and from the 63 to 76 million barrels of surplus referred to in Finding 4.

The Board concludes that the application could be granted without adversely affecting the protection for Alberta's requirements and the subsisting permit commitments.

Details of the Board's analysis relating to these matters are presented in Appendix D.

6. IN THE MATTER OF THE VOLUMES OWNED OR UNDER CONTRACT AND THE PERMIT VOLUMES FOR WHICH HOME OIL COMPANY LIMITED APPLIED

The Board finds that, over the twenty-year term for which Home requests authority to remove propane, it owns, or is agent for the owner of, in each of the initial seventeen years over 90 per cent of the propane it proposes to remove. Consequently, under the Board's policy for the issuance of permits for the removal of propane enunciated in OGCB Report 65-11, a permit could be issued, with the approval of the

Lieutenant Governor in Council, authorizing the removal of surplus propane up to the full volumes applied for by Home for the first seventeen years of the term of the proposed permit. The permit could specify for the final three years maximum quantities that would be that portion of the volumes which the Board expects to be recovered at the Carstairs processing plant which are equivalent to 110 per cent of the shares in such volumes of which Home will be the owner or the agent of the owner. These volumes are shown in Appendix D.

7. IN THE MATTER OF THE DISPOSITION OF THE APPLICATION OF HOME OIL COMPANY LIMITED

All things considered, the Board is prepared, with the approval of the Lieutenant Governor in Council, to issue a permit to Home Oil Company Limited authorizing it to remove from the Province the volumes of propane set out in Appendix D, the permit to be in the form shown in Appendix E and subject to the terms and conditions therein contained.

Respectfully submitted,

G. W. Govier, P.Eng.
Chairman

A. F. Manyluk, P. Eng.
Deputy Chairman

Vernon Millard,
Board Member

Dated at Calgary, Alberta

this 9th day of August, 1966.

APPENDIX A

THE PRESENT AND FUTURE PRODUCTION AND THE RESERVES OF PROPANE IN THE PROVINCE OF ALBERTA

Introduction

The Board, in OGCB Report 65-11(1), included a detailed estimate of the recoverable reserves of propane in the Province, a forecast of propane production from established reserves by years for the longer of the terms of the permits applied for at that time, and a forecast of propane production associated with two years growth of gas reserves.

Since the completion of OGCB Report 65-11, the Board has issued two additional reports dealing with applications regarding the removal of propane from the Province, OGCB 66-A(2) and OGCB Report 66-B(3). In each of the reports the Board made certain modifications to its forecast of propane production and estimate of propane reserves. These modifications were based on the most recent evidence available at the time of completion of each of the reports and they were made only where the resulting changes were, in the opinion of the Board, significant. Since the completion of the most recent report, additional evidence affecting propane production has become available. This evidence includes applications made to the Board to alter existing or to construct new processing facilities, additional gas analyses for various fields, pools or processing plants and the recent application of Trans-Canada Pipe Lines Limited for authorization for the removal of additional quantities of gas from the Province and the resulting OGCB Report 66-C(4). As a result of this new evidence and the fact that only significant changes were included in the two most recent propane reports, the Board has completely recalculated its propane production forecast and reserve estimates in this report.

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(1) Report on the Applications for Permits authorizing the Removal of Propane from the Province of Canadian Hydrocarbons Limited and The British American Oil Company Limited under The Gas Resources Preservation Act, 1956. September 1965.

(2) Report on the Application regarding the Removal of Propane from the Province by Pacific Petroleums Ltd. under The Gas Resources Preservation Act, 1956. January 1966.

(3) Report on the Applications regarding the Removal of Propane from the Province by The British American Oil Company Limited under The Gas Resources Preservation Act, 1956. March 1966.

As in the case of its earlier reports, the Board has concerned itself with the reserves and production of only field propane and has excluded propane produced in refineries and in conjunction with self-sustaining miscible flood projects.

With respect to the period covered by the forecast, since one of the tests which the Board applies in assessing the surplus involves a year by year supply-demand balance for the longer of the period of the requested permit or the longest existing permit to remove propane from the Province, the Board has completed its forecast for the period 1966 to 1987 inclusive.

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(4) Report on an Application of Trans-Canada Pipe Lines Limited under The Gas Resources Preservation Act, 1956. June 1966.

Future Production of Propane

1. Production of Propane from Established Gas Reserves

(1) Views of the Applicant

During the hearing of the application, a propane supply-demand balance for the Province was presented for the years 1967 to 1986 inclusive. The Provincial propane production as included in the balance was taken from OGCB 66-A. In reply to questioning, Mr. Paulson, on behalf of Home, stated that the applicant accepted the production forecast of the Board.

Home did include in its submission a forecast of propane production expected from the Carstairs processing plant from which it proposes to remove propane from the Province. The forecast was prepared by McDaniel Consultants (1965) Ltd.

(2) Views of the Board

The Board has reviewed its forecast of propane production from established gas reserves with respect to both the propane expected to be recovered from processing facilities in existence or approved by the Board as of August 1, 1966, and the additional quantities of propane that could result from future processing facilities.

Table A-1 presents the Board's forecast of propane production from established gas reserves for the period 1966 to 1987 based on existing propane recovery facilities including all facilities approved by the Board up to August 1, 1966. The table includes the expected production of propane from field facilities and from those constructed for the reprocessing of pipe line gas.

Table A-2 presents the Board's forecast of additional propane production expected from future processing facilities. The first part of the table presents a projection of the additional propane production which could result from the reprocessing of pipe line gas. This estimate reflects production from an anticipated processing plant on the Foothills Division of Alberta Gas Trunk Line beginning in 1970, and also from facilities to reprocess a small portion (ten per cent of the total production beginning in 1970 and increasing to twenty per cent in 1975) of the gas necessary to meet Alberta's future requirements in addition to that being processed at the Edmonton Liquid Gas Plant.

The table also includes an estimated increase in propane production that could result from a higher recovery at plants already producing. These increased recoveries would be made possible by changes in plant design to result in the recovery of a higher percentage of the propane. Also included in the table are production estimates for those fields where propane is not now being recovered but where the Board expects propane production might occur under more favourable marketing conditions. The recovery factors for these fields reflect the installation of deep-cut recovery facilities. Propane production from both of these sources is predicted to begin in 1970.

The Board in its OGCB Report 65-11 selected 1968 as the initial year of propane production from future processing facilities. The Board has again reviewed this group of fields and, having regard to the projected requirements for propane and to the amount of processing plant construction that would be necessary prior to the recovery of the propane represented in Table A-2, believes that 1970 is a more appropriate year as an average initial date of production.

The propane production from the reprocessing of pipe line gas was estimated in the light of the existing field facilities for the recovery of propane. If the additional facilities reflected in the second portion of the table (based on the installation of new facilities in some instances and of deep-cut facilities in others) are installed, this will result in a reduction in propane recovery from both existing and possible future pipe line reprocessing plants. For this reason, a third portion of the table has been prepared to reflect the reduction in propane production from reprocessing plants that would result with the installation of the additional field facilities.

The final portion of the table shows the total propane production expected from the Province. (Table A-1 plus Table A-2). This total reflects the expected gas production from all established reserves including three-quarters of those reserves now beyond economic reach. This gas production will be sufficient to meet all of the existing commitments for the removal of gas from the Province and the major portion of the future Provincial thirty-year gas requirements. The remainder of the Provincial requirements will be satisfied from the expected growth of gas reserves. The propane production associated with this gas will be discussed later in the appendix.

The following is a summary of the manner in which the forecasts in Tables A-1 and A-2 have been prepared:

1. The gas producing rates for each field or area were taken from the latest deliverability schedules available to the Board. Where the gas was being delivered to an extra-provincial market, production was considered for only the term of the applicable permit. Where schedules were not available or were outdated, the rate of gas production which was used is one million cubic feet per day for each ten billion cubic feet of reserves. In areas where the plant feed will be oil field separator gas, the producing rate was forecast on the basis of the expected oil allowables and gas-oil ratio behaviour for the pools involved. Where fields were not yet producing gas, the date of initial production was estimated having regard for the future Provincial requirements for gas and for the Board's knowledge of plans for pipe line construction in the Province. In keeping with the Board's policy with respect to satisfying the future thirty-year requirements of the Province for gas, production was estimated for a portion of those reserves now beyond economic reach. On the basis of the study referred to in OGCB Report 66-C the Board estimated that three-quarters of the reserves now beyond economic reach will be supplying a market within thirty years. The individual fields to be produced were selected bearing in mind the magnitude of each reserve, its location, the nearness of pipe

lines, and the expected development in drilling and in transportation facilities.

2. The composition of gas produced from each pool was based on a representative analysis.

3. Changes in the composition of the gas being produced from any particular pool were based on reservoir fluid studies wherever possible. In areas where retrograde effects were anticipated but fluid studies not available, changes in propane content were estimated by comparison to similar reservoirs for which studies were available. Where gas cycling schemes to curtail retrograde losses were in operation or expected in the future, the production forecast reflects the Board's estimate of how the propane recovery will be affected by cycling.

4. Plant recovery efficiencies were based on plant history wherever fields had been producing for a reasonable length of time. In several areas, plants were in the planning or construction stage or had been operating for only a short time, and in these instances, recoveries were based on submissions presented to the Board in support of applications under section 38 of The Oil and Gas Conservation Act or on the Board's general knowledge of plans for future plants in the Province. For those areas listed in Table A-2 where the Board had no information regarding the proposed plant design or where future and as yet undesigned deep-cut recovery facilities were expected, the recovery efficiencies were estimated having regard to expected economic conditions, the quantity and composition of

the gas to be produced, the heating value and dew point standards for the marketable gas. In general, the production expected from propane plants to be built or modified in the future reflects recoveries of from 60 to 75 per cent of the propane contained in the raw gas stream.

5. The gas throughput and composition for plants reprocessing pipe line gas were based on the predicted amount and composition of the residue gas available from the fields or areas supplying or expected to supply such plants. The propane recovery efficiencies were based on plant design for existing plants, and were estimated at eighty per cent for future plants.

The Board's forecast of propane production from established reserves and existing facilities as presented in Table A-1 shows an increase from a 1966 production rate of some 31,000 barrels per day to a peak of about 41,000 barrels per day in 1968. The production is then expected to remain approximately level until 1974 and to decline slowly to about 20,000 barrels per day by the year 1987, the end of the forecast period. The expected increase over the next three years results both from new processing facilities expected to be on stream within the next few years and from additional quantities of gas being processed at many of the existing plants. The decline in the later years is the result of a general decline in gas producing rates resulting from the gradual depletion of the pools currently producing and from the expiry of certain permits to remove gas from the Province.

Table A-2 shows that if market conditions are attractive, an additional quantity of propane in the order of 6,000 barrels per day will be produced beginning in 1970. This additional production may be recovered by field plants or by central facilities for the reprocessing of pipe line gas. The table also shows that the total propane production from established reserves will increase from a 1966 production rate of some 31,000 barrels per day to some 48,000 barrels per day in 1970, then remain approximately level until 1972, and thereafter will decline steadily to about 26,000 barrels per day in 1987.

The new forecast represents an increase since the Board's last published estimate (OGCB Report 66-B) of some 4,000 to 6,000 barrels per day beginning in 1967 and extending essentially until the end of the forecast period. The major changes in the projected propane production at individual processing plants since the Board's last estimate results from:

1. Propane recovery facilities have been approved by the Board for the Carstairs processing plant. This results in an increase in the forecast propane production from existing facilities of over 2,000 barrels per day beginning in 1967. (See also Item 5)

2. Propane recovery facilities have been approved by the Board for the Olds processing plant. This results in an increase in the forecast propane production from existing facilities of some 350 barrels per day beginning in 1967. (See also Item 5)

3. The processing of oil field residue gas from the Westerose Field at the Rimbey processing plant has been approved by the Board. Also, the partial cycling of the Westerose South D-3A Pool in the Westerose South Field, gas from which is processed at the Rimbey processing plant has been approved. This results in a total increase in forecast propane production from existing facilities of some 1,000 barrels per day beginning in 1967 and declining gradually to no increase about 1975 and thereafter.

4. Propane recovery facilities have been approved by the Board for the Waterton processing plant. This results in an increase in forecast propane production from existing facilities of some 1,100 barrels per day beginning in 1968, remaining at this level until 1971 and declining to some 380 barrels per day by 1987.

5. The projected production of propane from the Empress processing plant has been increased by some 2,000 barrels per day beginning in 1970. This increase is the net effect of an increase of some 25 per cent in the gas available for processing (reflecting the recent amendment to Permit No. TC 64-6) and a decrease in the average propane content of the available gas due to the installation of propane recovery facilities upstream of the Empress processing plant at the Carstairs and Olds processing plants.

6. Initial production from future processing facilities has been set back from 1968 to 1970.

7. Projected production from a plant on the Foothills Division of Alberta Gas Trunk Line has been reduced by some 800 barrels per day to reflect the installation of propane recovery facilities at the Waterton processing plant.

8. The projected propane production from future processing facilities has been reduced to reflect the installation of propane recovery facilities at the Carstairs and Olds processing plants which had been carried in the "future category" in previous Board reports.

Home proposed the removal from the Province of propane produced at the Carstairs processing plant, and at the hearing of its application, Mr. McDaniel presented a forecast of production from this plant for the period 1967 to 1986 inclusive. This forecast indicates that the total production from the processing plant will increase from some 2,100 barrels per day during 1967 to some 2,500 barrels per day for the years 1970 to 1973 inclusive. Production will then decline to some 2,400 barrels per day for the remainder of the forecast period.

The Board presents as part of Table A-1 its own estimate of the propane production expected from the Carstairs processing plant. The Board forecast was based on the plant operator's submission to the Board to expand the processing facilities and to recover propane and butanes. The through-puts of gas were based on the most recent delivery schedule available from Trans-Canada Pipe Lines Limited the purchaser of the residue gas from the Carstairs processing plant, and on the

Board's own estimate of gas reserves and delivery characteristics of the pools supplying the plant. The Board's forecast of propane production from the Carstairs processing plant compares very closely with the applicant's forecast except for the latter years of the period under study for which the Board predicts a substantial decline in the propane producing rate resulting from an anticipated decline in the maximum gas delivery rates. At the hearing, Mr. McDaniel on behalf of Home, agreed that on the basis of the gas reserves as currently known, he would anticipate that there would tend to be a tailing off of production in the last two or three years of the period under study.

2. Production of Propane from Gas Reserves Not Yet Discovered

(1) Views of the Applicant

The propane supply-demand balance for the Province as submitted by Home reflects the Provincial propane production as forecast by the Board in OGCB 66-A. Included in the total supply was the Board's forecast of propane production from two years growth of gas reserves. The applicant did not make any specific reference to this portion of the production forecast.

(2) Views of the Board

The Board has updated its forecast of the propane recoverable from two years growth of gas reserves presented in OGCB Report 65-11. In general terms, the forecast of future propane production from gas reserves not yet discovered involves

(a) a projection of the growth rate for gas reserves,

(b) a projection of the annual pattern by which these reserves will be produced, and

(c) an estimate of the recoveries of propane from this future gas.

The Board's OGCB Report 66-18(5) includes a detailed analysis of the trends in the growth and discovery of gas reserves as of December 31, 1965. The trends have not been re-analysed in detail at this time but the Board has, in OGCB Report 66-C, recalculated the long-term growth rate to include reserve data up to February 28, 1966. The recalculation shows that the long-term growth rate for gas reserves has remained unchanged at some 2.5 trillion cubic feet per year. It also shows that the actual reserve growth over the two-year period prior to the report, March 1, 1964 to February 28, 1966, was some 6.2 trillion cubic feet. Therefore, in keeping with Board policy of using the lesser of the actual growth in reserves over the two previous years or two years of growth at the long-term growth rate, the Board has decided to rely on the propane expected from 5.0 trillion cubic feet of gas reserves not yet developed in satisfying Alberta's long-term requirements for propane.

In order to project the annual pattern by which these new gas reserves will be produced, the Board has attempted to estimate what amount of the future reserves will be required to help meet Alberta's thirty-year requirements for gas. A comparison of the available supply to the existing requirements indicates that approximately 3.9 trillion cubic feet of gas reserves not yet developed will be needed to satisfy Alberta's requirements. If the expected growth over a two-year period is relied upon, a surplus of some 1.1 trillion cubic feet results and will be available for extraprovincial markets.. Consequently the production from future gas reserves will be the sum of the production from the 3.9 trillion cubic feet needed to satisfy the Province's future requirements and the production from the 1.1 trillion cubic feet available for extraprovincial markets. On the basis of detailed deliverability schedules, the Board estimates that production to supply local markets will begin at low rates about 1972 and will build up to a maximum of about 130 billion cubic feet per year by the end of the forecast period. With respect to the remainder of the two-year growth of gas reserves, the Board estimates that the gas surplus to Alberta's requirements will be produced for other markets at the rate of one million cubic feet per day for each 10 billion cubic feet of surplus reserves, beginning in the fourth full calendar year after the date of discovery. This time lag is intended to reflect the time necessary to develop the reserves, to obtain the necessary Board and Government approvals, and to develop additional markets for Alberta gas. The application of these estimates to the surplus of 1.1

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(5) Reserves of Crude Oil, Gas, Natural Gas Liquids and Sulphur, Province of Alberta. December 31,1965.

trillion cubic feet results in production beginning in 1970 at some 40 billion cubic feet per year and remaining constant throughout the remainder of the forecast period. The expected gas production for reserves not yet developed is shown in columns 2, 3 and 4 of Table A-3.

To estimate the recoverable propane associated with the future growth in gas reserves, the Board has reviewed the detailed study regarding this matter that was included in OGCB Report 65-11. As a result of the review, the Board has concluded that its earlier estimate that the propane content of the two years growth of gas reserves will be twenty barrels per million cubic feet is a reasonable one. The wellhead production of propane resulting from the projected gas production and the estimated propane content is shown in column 5 of Table A-3. Currently, about sixty per cent of the propane in the composite gas stream produced in the Province is being recovered as a commercial product. For this reason, the Board believes that its earlier estimate that only fifty per cent of the propane in the gas reserves not yet developed will be recovered is somewhat low and has decided to use the current recovery factor of sixty per cent. The resulting propane production expected from this gas is shown in column 6 of Table A-3. The table shows that propane production from reserves not yet developed will begin in 1970 at some 1,300 barrels per day and will increase steadily to some 5,600 barrels per day by 1987.

Table A-4 presents the total future propane production as estimated by the Board. The estimates have been taken from Tables A-1, A-2 and A-3, and the totals have been rounded to the nearest 100 barrels per day. The table shows that the total future potential propane production for the Province will increase from a 1966 rate of some 31,000 barrels per day to a peak of some 49,000 barrels per day in 1970. The production will then decline to some 31,000 barrels per day by 1987, the final year of the forecast period.

Reserves of Propane

(1) Views of the Applicant

Home did not, at the hearing of its application, submit an estimate of the propane reserves in the Province. However, it did include in its estimate of the propane surplus remaining at the end of 1986, a total recoverable propane estimate taken from the Board's report OGCB 66-A. Mr. McDaniel, who testified on behalf of Home, stated "In the work we have done we found relatively close agreement in reserves and feel that the adoption of the Board's reserves for this purpose is a very realistic consideration of the propane reserves in the Province."

(2) Views of the Board

The Board has updated its estimate of the established propane reserves in the Province to reflect data to February 28, 1966, and its estimate of the propane associated with two years growth of gas reserves. Table A-5 presents the established recoverable reserves of propane as estimated by the Board. Part A of the table tabulates those fields or areas where propane is now being recovered. Part B lists those fields or areas where propane will be economically recoverable in the future. The table has been prepared by averaging the recovery ratios for each pool in the forecast over the life of the pool, and by multiplying the resulting average ratio by the remaining gas reserves for the pool. Columns 1, 2 and 3 of the table show the gas processing plant name, the fields or areas being served by the plant and the producing pools. Column 4 is the total remaining marketable gas reserve for the pools designated in column 3. These reserves have been taken from Table A-1 of the Board's OGCB Report 66-C. Column 5 is a tabulation of the average propane recovery factor over the life of each pool as determined from Table A-1 and A-2. Column 6 is the product of columns 4 and 5 and is the recoverable propane reserve for each field, area or plant.

The table shows, in addition to the reserves recoverable from existing or approved field processing plants, propane reserves that could result from the reprocessing, in both existing and approved future facilities, of pipe line gas. Since these estimates have been based on the residue gas available from existing field facilities, the installation of the future facilities reflected in the second portion of the table would result in a reduction in the reserves available from this source. For this reason, part C of the table has been included to adjust downward the reserves available from the reprocessing of pipe line gas and to make them consistent with the additional reserves shown for field recovery facilities.

Table A-5 shows that the recoverable propane reserves based on existing processing facilities are estimated by the Board as of February 28, 1966 at some 386 million barrels. The table also shows that if sufficient demand for the product should materialize, an additional 55 million barrels of propane can be considered as recoverable, increasing the total established reserves to some 441 million barrels.

It has been mentioned earlier in this appendix that the Board estimates that the propane content of the 5.0 trillion cubic feet of gas reserves not yet developed (two years growth) is some 20 barrels per million cubic feet and that some 60 per cent of this propane may be considered as recoverable. This results in a propane reserve from future gas of some 60 million barrels, increasing the total reserves to about 501 million barrels.

This represents an increase in the propane reserves since the Board's last published estimate in OGCB Report 66-B, of some 40 million barrels from existing and future facilities and some 17 million barrels from gas reserves not yet developed. The major changes since the Board's last estimate result from:

1. Facilities for the recovery of propane are to be added at the Carstairs, Waterton and Olds gas processing plants. As a result the reserves for these fields have increased by some 12 million barrels.

2. An increase in the Pembina Cardium solution gas reserves has resulted in an increase in the propane reserves associated with the Pembina plant of some 8 million barrels.

3. The processing of Westerose gas in the Rimbey gas processing plant has increased the reserves associated with the Rimbey plant by some 3 million barrels.

4. The predicted increase in gas through-puts at the Empress plant associated with the recent amendment to Permit No. TC 64-6 has resulted in an increase in the recoverable propane reserves of some 5 million barrels.

5. A restudy of Windfall has indicated that the previous propane recovery ratio was high. The newly adopted ratio has resulted in a decrease in the reserves of some 4 million barrels.

6. The forecast of the propane recoverable from the gas reserves not yet discovered has increased by some 17 million barrels.

TABLE A-1

FORECAST OF PROPANE PRODUCTION FROM ESTABLISHED GAS RESERVES

BASED ON EXISTING(1) PLANT FACILITIES (BARRELS PER DAY)

PLANT	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
ACHESON	230	250	280	290	290	290	290	290	300	300	300	290	290	290	280	270	260	230	180	160	130	110
BONNIE GLEN(2)	690	700	710	740	760	770	780	780	790	780	780	770	760	750	750	740	730	720	710	700	690	660
CARSON CREEK(3)	-	2180	1850	1720	1640	1570	1500	1470	1450	1410	1340	1300	1250	1220	470	470	480	480	480	480	560	560
CARSTAIRS(4)	-	1800	2300	2300	2530	2530	2530	2530	2440	2440	2440	2440	2440	2440	2440	2440	2440	2440	2320	2120	1870	1470
CROSSFIELD	970	900	840	1040	1040	1040	1040	1040	1040	1040	1040	1040	1040	1040	1040	1040	1040	1000	-(11)	-	-	-
HARMATTAN(5)	2880	2750	2660	2150	1910	1770	1750	1610	1480	1480	1480	1480	1480	1480	1480	1480	1480	1480	1480	1480	1480	1480
HUSSAR	560	590	630	630	630	630	630	630	630	630	630	630	630	630	630	580	450	370	-(12)	-	-	-
JUDY CREEK(6)	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600
LEDUC-WOODBEND(7)	680	700	700	700	570	400	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050
NEVIS(8)	230	780	910	930	990	990	990	990	990	1000	1000	1000	1000	1020	1040	1040	1030	1020	840	570	480	410
OLDS	-	150	360	360	380	380	380	380	380	380	380	380	380	400	400	400	400	400	380	340	310	290
PEMBINA(9)	2760	2830	2440	2500	2550	2640	2580	2540	2520	2500	2390	2280	2190	2100	2080	2000	1920	1850	1780	1710	1670	1630
PINCHER CREEK	340	340	300	280	270	250	230	220	220	220	220	220	220	220	210	210	210	210	210	210	210	210
REDWATER	300	340	350	360	370	370	380	380	380	380	390	380	400	400	400	400	400	390	380	310	250	200
RIMBEY(10)	6100	7340	7500	7500	7500	7500	7300	7100	6800	5800	5700	5600	5500	5400	5000	4600	3600	2700	1700	700	-(12)	-
TURNER VALLEY	580	580	580	580	580	580	580	580	580	540	480	360	330	280	260	220	210	180	180	170	160	140
WATERTON	-	-	1100	1100	1100	1100	1080	1070	1050	1040	1030	1010	1000	990	970	960	860	770	670	580	480	380
WAYNE-ROSEDALE	40	40	50	50	50	50	50	50	50	50	50	50	50	40	40	40	40	40	40	40	20	-(12)
WILLESDEN GREEN	270	230	210	200	200	200	200	180	180	180	170	170	160	140	120	120	120	120	120	120	120	120
WORSLEY	230	230	230	230	230	230	230	230	210	200	180	160	150	100	70	-(12)	-	-	-	-	-	-
SUB-TOTAL	20460	26330	27600	27260	27190	26890	27170	26720	26140	25020	24650	24210	23920	23590	22330	21660	20320	19050	16120	14340	13080	12310
EDMONTON LIQUID GAS	1000	1000	1200	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1250	1200	1150	1100	1050	1000	950	900	850
EMPRESS	9800	10300	11900	12500	13100	13100	13100	13100	13100	13100	13100	13100	13100	13100	13000	12300	11600	10900	10200	9500	8500	7100
TOTAL	31260	37630	40700	41060	41590	41290	41570	41120	40540	39420	39050	38610	38320	37940	36530	35110	33020	31000	27320	24790	22480	20260

NOTE: FOOTNOTES ON THE FOLLOWING PAGE

FOOTNOTES - TABLE A-1

(1) Includes Facilities Approved by the Board up to August 1, 1966.

(2) Includes Bonnie Glen, Glen Park and Wizard Lake.

(3) Includes Carson Creek and Carson Creek North Fields.

(4) Includes Carstairs Field and a portion of Crossfield Field.

(5) Includes Harmattan-Elkton and Harmattan East Fields.

(6) Includes Swan Hills, Swan Hills South, Judy Creek and Virginia Hills Fields.

(7) Includes Leduc-Woodbend and Golden Spike Fields.

(8) Includes Nevis, Stettler, Fenn-Big Valley, Hackett, Erskine and Rich Fields.

(9) Propane Recovered at Two Plants.

(10) Includes Homeglen-Rimbey, Westerose South and Westerose Fields.

(11) Permit Expires.

(12) Gas Reserves Depleted.

TABLE A-2

FORECAST OF ADDITIONAL PROPANE PRODUCTION FROM ESTABLISHED GAS RESERVES AND FUTURE PLANT FACILITIES (Barrels Per Day)

PLANT, FIELD OR AREA	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Plant on Foothills Division of Alberta Gas Trunk Line	-	-	-	-	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	4200	3700
Other Plants for Reprocessing of Pipe Line Gas	-	-	-	-	400	400	400	450	450	900	900	900	950	950	950	1000	1000	1000	1000	1000	1000	1000
Sub-Total					4600	4600	4600	4650	4650	5100	5100	5100	5150	5150	5150	5200	5200	5200	5200	5200	5200	4700
Increased Production(1)	-	-	-	-	1700	1700	1700	1700	1700	1700	1650	1600	1600	1550	1550	1550	1500	1500	1450	1400	1400	1400
Gilby	-	-	-	-	1290	1290	1290	1290	1290	1290	1290	1290	1290	1270	1140	1030	930	840	760	700	640	580
Lookout Butte	-	-	-	-	-	300	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420	420
Medicine River	-	-	-	-	330	330	330	330	330	330	330	330	330	330	340	340	340	340	340	340	340	340
Minnehik-Buck Lake	-	-	-	-	610	610	610	610	610	610	610	610	620	620	630	630	630	580	490	420	370	320
Simonette	-	-	-	-	150	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270
Sylvan Lake	-	-	-	-	890	890	890	890	890	890	890	890	890	890	890	890	890	830	730	650	590	530
Wimborne	-	-	-	-	370	370	370	370	370	370	370	370	370	370	360	360	350	340	320	300	200	-
Windfall	-	-	-	-	1400	1050	650	450	400	300	250	250	250	250	250	250	200	200	200	200	200	200
Sub-Total	-	-	-	-	6740	6810	6530	6330	6280	6180	6080	6030	6040	5970	5850	5740	5530	5320	4980	4700	4430	4060
Less Decreased Recovery From Reprocessing Plants	-	-	-	-	5200	5200	5000	4900	4800	4700	4700	4600	4600	4500	4500	4300	4200	4000	3700	3500	3300	3100
TOTAL	-	-	-	-	6140	6210	6130	6080	6130	6580	6480	6530	6590	6620	6500	6640	6530	6520	6480	6400	6330	5660
TOTAL PROPANE PRODUCTION (Table A-1 plus Table A-2)	31260	37630	40700	41060	47730	47500	47700	47200	46670	46000	45530	45140	44910	44560	43030	41750	39550	37520	33800	31190	28810	25920

(1) Increased Production From Fields Shown In Table A-1.

TABLE A-3

FORECAST OF PROPANE PRODUCTION FROM GAS RESERVES NOT YET DEVELOPED

(1) YEAR	(2) GAS PRODUCTION TO MEET ALBERTA REQUIREMENTS(1) (Bcf)	(3) GAS PRODUCTION FOR EXTRAPROVINCIAL MARKETS(2) (Bcf)	(4) TOTAL GAS PRODUCTION FROM RESERVES NOT YET DEVELOPED (Bcf)	(5) PROPANE CONTAINED IN GAS STREAM SHOWN IN COLUMN 4(3) (Thousands of Barrels)	(6) PROPANE PRODUCTION(4) (Barrels Per Day)
1970		40.0	40.0	800	1320
1971		40.0	40.0	800	1320
1972	4.0	40.0	44.0	880	1450
1973	7.0	40.0	47.0	940	1550
1974	10.0	40.0	50.0	1000	1640
1975	15.0	40.0	55.0	1100	1810
1976	20.0	40.0	60.0	1200	1970
1977	25.0	40.0	65,0	1300	2140
1978	30.0	40.0	70.0	1400	2300
1979	40.0	40.0	80.0	1600	2630
1980	50.0	40.0	90.0	1800	2960
1981	60.0	40.0	100.0	2000	3290
1982	70.0	40.0	110.0	2200	3620
1983	80.0	40.0	120.0	2400	3950
1984	90.0	40.0	130.0	2600	4270
1985	100.0	40.0	140.0	2800	4600
1986	110.0	40.0	150.0	3000	4930
1987	130.0	40.0	170.0	3400	5590

(1) Based on Detailed Delivery Schedule.

(2) Based on Production Rate of One MMcf Per Ten Bcf of Available Reserves Beginning in the Fourth Year After Date of Discovery.

(3) Based on Propane Content of Twenty Barrels Per Million Cubic Feet of Gas.

(4) Based on Recovery Factor of Sixty Per Cent.

TABLE A-4

TOTAL PROPANE PRODUCTION FORECAST BY THE BOARD

(Barrels Per Day)

YEAR	FROM EXISTING PROCESSING FACILITIES	INCLUDING FUTURE PROCESSING FACILITIES	FROM TWO YEARS GROWTH OF GAS RESERVES	TOTAL	
				FROM EXISTING PROCESSING FACILITIES PLUS TWO YEARS GROWTH OF GAS RESERVES	INCLUDING FUTURE GAS PROCESSING FACILITIES PLUS TWO YEARS GROWTH OF GAS RESERVES
1966	31,260	31,260	-	31,300	31,300
1967	37,630	37,630	-	37,600	37,600
1968	40,700	40,700	-	40,700	40,700
1969	41,060	41,060	-	41,100	41,100
1970	41,590	47,730	1,320	42,900	49,100
1971	41,290	47,500	1,320	42,600	48,800
1972	41,570	47,700	1,450	43,000	49,200
1973	41,120	47,200	1,550	42,700	48,800
1974	40,540	46,670	1,640	42,200	48,300
1975	39,420	46,000	1,810	41,200	47,800
1976	39,050	45,530	1,970	41,000	47,500
1977	38,610	45,140	2,140	40,800	47,300
1978	38,320	44,910	2,300	40,600	47,200
1979	37,940	44,560	2,630	40,600	47,200
1980	36,530	43,030	2,960	39,500	46,000
1981	35,110	41,750	3,290	38,400	45,000
1982	33,020	39,550	3,620	36,600	43,200
1983	31,000	37,520	3,950	35,000	41,500
1984	27,320	33,800	4,270	31,600	38,100
1985	24,790	31,190	4,600	29,400	35,800
1986	22,480	28,810	4,930	27,400	33,700
1987	20,260	25,920	5,590	25,900	31,500

TABLE A-5

RECOVERABLE RESERVES OF PROPANE AS OF FEBRUARY 28, 1966

(1) PLANT	(2) FIELD OR AREA	(3) ZONE	(4) REMAINING MARKETABLE RESERVES OF NATURAL GAS (Bcf)	(5) PROPANE RECOVERY RATIOS Bbl/MMcf of Marketable Gas	(6) RECOVERABLE PROPANE (Millions of Barrels)
A. From Existing Plant Facilities					
Acheson	Acheson	Leduc & Blairmore	37	58.0	2.1
Bonnie Glen	Bonnie Glen	Leduc	545	28.0	15.3
	Glen Park	Leduc	8	24.0	0.2
	Wizard Lake	Leduc	90	26.0	2.3
					17.8
Carson Creek	Carson Creek	Beaverhill Lake	233	23.0	5.4
	Carson Creek North	Beaverhill Lake	157	37.0	5.8
					11.2
Carstairs	Carstairs	Mississippian	696	14.0	9.7
	Crossfield	Crossfield Mississippian	914	13.0	11.9
					21.6
Crossfield	Crossfield	Calgary Mississippian & Blairmore	616	11.0	6.8
		Calgary Wabamun	699	0.5	0.3
					7.1
Harmattan-Elkton	Harmattan-Elkton	Mississippian	1035	13.0	13.5
	Harmattan East	Mississippian	997	23.0	22.9
					36.4
Hussar(1)	Hussar	Colorado & Blairmore	451	8.7	3.9
Judy Creek	Judy Creek	Beaverhill Lake	231	60.0	13.9
	Swan Hills & Swan Hills South	Beaverhill Lake	382	70.0	26.7
	Virginia Hills	Beaverhill Lake	34	75.0	2.6
					43.2

(CONTINUED)

TABLE A-5 (CONTINUED)

(1) PLANT	(2) FIELD OR AREA	(3) ZONE	(4) REMAINING MARKETABLE RESERVES OF NATURAL GAS (Bcf)	(5) PROPANE RECOVERY RATIOS Bbl/MMcf OF MARKETABLE GAS	(6) RECOVERABLE PROPANE (Millions of Barrels
Leduc-Woodbend	Leduc-Woodbend	Nisku & Leduc	389	40.0	15.6
	Golden Spike	Nisku & Leduc	91	50.0	4.6
					20.2
Nevis	Nevis	Devonian	590	6.0	3.5
	Stettler	Nisku & Leduc	7	93.0	0.7
	Fenn-Big Valley	Nisku & Leduc	49	71.0	3.5
	Hackett	Blairmore	47	13.0	0.6
	Erskine	Blairmore	16	11.0	0.2
	Rich	Blairmore	12	14.0	0.2
					8.7
Olds	Olds	Wabamun	236	13.0	3.1
Pembina[2]	Pembina	Cardium	979	35.0	34.3
Pincher Creek	Pincher Creek	Mississippian	306	7.0	2.1
Redwater	Redwater	Leduc	40	120.0	4.8
Rimbey	Homeglen-Rimbey	Leduc	639	18.0	11.5
	Westerose	Leduc	169	25.0	4.2
	Westerose South	Leduc	1050	27.0	28.4
					44.1
Turner Valley	Turner Valley	Mississippian	206	16.0	3.3
Waterton	Waterton	Mississippian	1038	7.0	7.3
		Devonian	134	6.0	0.8
					8.1
Wayne-Rosedale[3]	Wayne-Rosedale	Viking & Blairmore	335	1.0	0.3

(CONTINUED)

TABLE A-5 (continued)

(1) PLANT	(2) FIELD OR AREA	(3) ZONE	(4) REMAINING MARKETABLE RESERVES OF NATURAL GAS (Bcf)	(5) PROPANE RECOVERY RATIOS Bbl/MMcf of Marketable Gas	(6) RECOVERABLE PROPANE (Millions of Barrels)
Willesden Green	Willesden Green	Cardium	67	30.0	2.0
Worsley	Worsley	Leduc	190	6.0	1.1
SUB-TOTAL					275.4
Edmonton Liquid Gas					11.0
Empress					100.0
TOTAL					386.4
B. From Future Plant Facilities					
Plant on Foothills Division of Alberta Gas Trunk Line					35.0
Other Plants for Reprocessing of Pipe Line Gas					7.0
SUB-TOTAL					42.0
Increased Production(4)					
Gilby	Gilby	Blairmore, Jurassic & Pekisko	664	12.0	8.0
Lookout Butte	Lookout Butte	Mississippian	400	10.0	4.0
Medicine River	Medicine River	Blairmore, Jurassic & Mississippian	218	14.0	3.1
Minnehik-Buck Lake	Minnehik-Buck Lake	Mississippian	367	11.0	4.0

TABLE A-5 (continued)

(1) PLANT	(2) FIELD OR AREA	(3) ZONE	(4) REMAINING MARKETABLE RESERVES OF NATURAL GAS (Bcf)	(5) PROPANE RECOVERY RATIOS Bbl/MMcf of Marketable Gas	(6) RECOVERABLE PROPANE (Millions of Barrels)
Simonette	Simonette	Wabamun & Leduc	161	15.0	2.4
Sylvan Lake	Sylvan Lake	Blairmore, Jurassic Mississippian & Leduc	449	14.0	6.3
Wimborne	Wimborne	Leduc	221	10.0	2.2
Windfall	Windfall	Leduc	448	6.0	2.7
SUB-TOTAL					50.7
Total From Future Plant Facilities					92.7
C. Less Decreased Recovery From Reprocessing Plants					38.0
TOTAL PROPANE RESERVE					441.1

(1) That portion of the gas processed in the Tenneco Plant.

(2) Propane recovered at two Plants.

(3) That portion of gas processed at the CPOG Plant.

(4) Increased production from fields shown in Table A-1.

APPENDIX B

ALBERTA'S PROPANE REQUIREMENTS AND PERMIT COMMITMENTS

Alberta's Propane Requirements

The applicant adopted the Board's forecast of Alberta's propane requirements, published in the OGCB Report 65-11(1). In view of the lack of further evidence by the applicant and the relatively short lapse of time since the previous forecast, the Board has decided not to alter its forecast at this time. Table B-1 shows the Board projection for the period 1966 to 1995.

Permit Commitments

Present permit commitments consist of the amounts approved under Canadian Hydrocarbons' Permit No. CH 65-1, Pacific Petroleums Permit No. PP 66-2, as amended, the British American Permit No. BA 65-1 up to September 30, 1966, and the British American Permit No. BA 66-2.

Canadian Hydrocarbons' permit is for a term from November 1, 1966, to October 31, 1986, with maximum amounts for consecutive twelve-month periods declining from some 2,100 barrels per day in 1967 to some 1,500 barrels per day for 1974 and subsequent periods. Pacific Petroleums' permit runs from November 1, 1965, to October 31, 1987. An amendment to the permit provides for the removal from the Province by the Permittee of amounts of propane equal to the lesser of 115 per cent of the amounts prescribed in the permit for the twelve-month periods between November 1, 1965 and October 31, 1983 or the actual production from the Empress processing plant. The Board's forecast of production from the Empress plant is shown in Appendix A of this Report. Under the revised permit, maximum amounts for consecutive twelve-month periods begin at 9,800 barrels per day in 1966 and increase to 12,650 barrels per day from 1970 to 1979 inclusive, declining thereafter to 1,700 barrels per day by 1987. The commitment relating to the British American Permit No. BA 65-1 is equivalent to 1,500 barrels per day for 1966; the permit terminates on September 30, 1966. British American's Permit No. BA 66-2 has a term from October 1, 1966, to September 30, 1976. The maximum amount for consecutive twelve-month periods is 7,800 barrels per day throughout the term of the permit.

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(1) Report on the Applications for Permits authorizing the Removal of Propane from the Province of Canadian Hydrocarbons Limited and The British American Oil Company Limited under The Gas Resources Preservation Act, 1956. September 1965.

Total permit commitments as shown in Table B-2 rise from 11,300 barrels per day in 1966 to some 22,400 barrels in 1970 and decline thereafter to 1,700 barrels per day by 1987, resulting in overall thirty-year commitments of some 124 million barrels.

Table B-3

Table B-3 shows total of Alberta's requirements and permit commitments, 1966 to 1995, as given by the summation of Tables B-1 and B-2.

TABLE B-1

Forecast Total Alberta's Requirements for Propane

1966-1995

(Barrels Per Day)

Year	Board
1966	9,000
1967	9,400
1968	10,000
1969	10,400
1970	12,900
1971	13,900
1972	14,800
1973	15,600
1974	16,100
1975	16,300
1976	17,400
1977	18,100
1978	19,000
1979	19,900
1980	21,800
1981	22,200
1982	22,700
1983	23,100
1984	23,600
1985	24,000
1986	24,600
1987	24,900
1988	25,400
1989	25,800
1990	26,300
1991	26,600
1992	27,100
1993	27,500
1994	28,000
1995	28,400
30-Year Requirements (Millions of Barrels)	221
Average Annual Cumulative Growth Rate (%)	
1966-1981	6.2
1981-1995	1.8
1966-1995	4.0

TABLE B-2

Permit Commitments 1966-1995

(Barrels Per Day)

Year	Permit No. CH 65-1* Canadian Hydrocarbons	Permit No. PP 66-2* Pacific Petroleums	Permit No. BA 66-2** British American	Total Commitments
1966	-	9,800	-	11,300***
1967	2,130	10,300	7,800	20,230
1968	2,040	11,900	7,800	21,740
1969	2,040	12,500	7,800	22,340
1970	1,910	12,650	7,800	22,360
1971	1,770	12,650	7,800	22,220
1972	1,750	12,650	7,800	22,200
1973	1,610	12,650	7,800	22,060
1974	1,480	12,650	7,800	21,930
1975	1,480	12,650	7,800	21,930
1976	1,480	12,650	7,800	21,930
1977	1,480	12,650	-	14,130
1978	1,480	12,650	-	14,130
1979	1,480	12,650	-	14,130
1980	1,480	11,730	-	13,210
1981	1,480	11,040	-	12,520
1982	1,480	10,240	-	11,720
1983	1,480	9,430	-	10,910
1984	1,480	6,300	-	7,780
1985	1,480	4,700	-	6,180
1986	1,480	2,700	-	4,180
1987	-	1,700	-	1,700
1988	-	-	-	-
1989	-	-	-	-
1990	-	-	-	-
1991	-	-	-	-
1992	-	-	-	-
1993	-	-	-	-
1994	-	-	-	-
1995	-	-	-	-
30-Year Commitments (Millions of Barrels)	12	84	28	124

* Amounts represent authorized permit volumes for the 12 months ending October 31 in each year. In the case of Canadian Hydrocarbons it is assumed that additional purchase contracts are made by the permittee, up to the maximum allowed in the permit.

** Amounts represent authorized permit volumes for the 12 months ending September 30 in each year. It is assumed that additional purchase contracts are made by the permittee, up to the maximum allowed in the permit.

*** Includes 1,500 barrels per day under the British American Permit No. BA 65-1, to cover the period January 1 to September 30, 1966 inclusive.

TABLE B-3

Total Alberta's Requirements and Permit Commitments 1966-1995

(Barrels Per Day)

Year	Board
1966	20,300
1967	29,600
1968	31,700
1969	32,700
1970	35,300
1971	36,100
1972	37,000
1973	37,700
1974	38,000
1975	38,200
1976	39,300
1977	32,200
1978	33,100
1979	34,000
1980	35,000
1981	34,700
1982	34,400
1983	34,000
1984	31,400
1985	30,200
1986	28,800
1987	26,600
1988	25,400
1989	25,800
1990	26,300
1991	26,600
1992	27,100
1993	27,500
1994	28,000
1995	28,400
30-Year Requirements and Permit Commitments (Millions of Barrels)	345

APPENDIX C

THE MEETING OF THE PRESENT AND FUTURE REQUIREMENTS OF ALBERTA FOR PROPANE AND THE PERMIT COMMITMENTS AND THE RESULTING SURPLUS

Views of the Applicant

Home, at the hearing of its application, presented a propane supply-demand balance for the Province for the period 1967 to 1986 inclusive. The production and the Alberta requirements reflected in the balance were taken from the Board's OGCB 66-A(1). The commitments for the removal of propane from the Province as included in the balance reflect the permit commitments existing at the time the application was made (Permits No. PP 66-2 and CH 65-1), the quantities applied for earlier by The British American Oil Company Limited (since authorized by Permit No. BA 66-2), and the additional quantities applied for by Canadian Hydrocarbons at the hearing held on the same day as the Home hearing. (As mentioned in the introduction of this report, the Canadian Hydrocarbons' application has since been withdrawn.) The balance shows a surplus of some 3,000 barrels per day in 1967 increasing to 9,000 barrels per day in 1968. The surplus then declines to some 4,700 barrels per day in 1974 and again increases to some 10,500 barrels per day by 1977. Thereafter it declines to a more or less balanced position for the period 1984 to 1986 inclusive. If the additional quantities for which Canadian Hydrocarbons applied are subtracted from the permit commitments, the said surplus will increase by some 1,000 barrels per day for the period 1967 to 1982 inclusive and by some 600 to 800 barrels per day for the remainder of the period.

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(1) Report on the Application regarding the Removal of Propane from the Province by Pacific Petroleums Ltd. under The Gas Resources Preservation Act, 1956. January 1966.

Home also presented an estimate of the propane reserves remaining at the end of 1986 and a comparison of these reserves to the requirements for the remainder of the thirty-year period. As in the case of the supply-demand balance, the production rates, the reserves and the requirements were taken from OGCB 66-A. The only adjustments made were to the permit commitments in that Home included the quantities now authorized by Permit No. BA 66-2, the additional quantities applied for by Canadian Hydrocarbons, and its own application of some 9.9 million barrels. The calculations submitted by Home showed that propane reserves of some 147 million barrels would remain at the end of 1986 (the end of the proposed permit term), and that these reserves exceed the requirements of the remainder of the thirty-year period by some 58 million barrels.

Views of the Board

As discussed in earlier Board reports dealing with the removal of propane from the Province, the Board believes that there are three tests which must be satisfied in protecting for Alberta's requirements. The first test involves comparison of the total propane reserves (including those associated with two years growth of gas reserves) to the total thirty-year requirements. The second test involves a year by year supply-demand balance for the longer of the term of the permit applied for or the term of the longest existing permit to remove propane from the Province. The final test is a substitute for a year by year supply-demand balance for the remainder of the thirty-year period and involves a comparison of the propane reserves remaining at the end of the period analysed on a year by year basis to the total requirements for the remainder of the thirty-year period.

1. Total Balance

The Board has compared the reserve and requirement estimates presented and described in detail in Appendices A and B. This calculation and the resulting surplus are shown in Table C-1.

The table shows that the propane reserves from existing processing plant facilities as estimated by the Board are some 101 million barrels greater than the total thirty-year requirements. If the reserves from future processing plant facilities are included, this surplus increases to about 156 million barrels. The Board considers that greater weight should be placed on the latter figure.

2. Balance on a Year by Year Basis

The Board has reviewed its studies referred to in OGCB Report 65-11(2) regarding the ability of the Provincial propane production to meet seasonal peak demand for this product, the role of storage in the meeting of this demand, and the regional distribution of propane production and demand. On the basis of this review the Board remains of the opinion that for the present time it is appropriate to carry out its analysis of the yearly supply-demand balance on an annual and a Province-wide basis.

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(2) Report on the Applications for Permits authorizing the Removal of Propane from the Province of Canadian Hydrocarbons Limited and The British American Oil Company Limited under The Gas Resources Preservation Act, 1956. September 1965.

Table C-2 presents a supply-demand balance for the period 1966 to 1987 inclusive, based on the Board's estimates of supply and demand as presented in Appendices A and B. The table shows two cases: one reflecting production from existing propane recovery facilities and two years growth of gas reserves, and the other including future processing facilities. The production and requirements have been taken from Table A-4 and B-3 respectively.

The table shows that for the case of propane production from existing facilities and two years growth of gas reserves, a surplus of greater than 8,000 barrels per day exists for the period 1966 to 1969 inclusive. The surplus then declines to the extent that a small deficiency exists for the years 1985, 1986 and 1987. Including production from future processing facilities, the projected surplus is 8,000 to 11,000 barrels per day for 1966 to 1969 inclusive, increases to over 13,000 barrels per day in 1970, and then declines to some 5,000 barrels per day by 1987.

The Board's forecast surplus including future processing plant facilities is greater than that forecast by Home. This occurs primarily because the Board has updated the production forecast on which Home's balance was based, and now estimates that future propane production will be considerably higher than the estimates presented in OGCB 66-A.

3. Balance for Remainder of Thirty-year Period

Table C-3 has been prepared as a substitute for a year by year supply-demand balance for the remainder of the thirty-year period. It is a comparison of the remaining propane reserves as of the end of 1987 (the end of the term of Permit No. PP 66-2) to the total requirements of the Province for the remainder of the thirty-year period, 1988 to 1995 inclusive. The table presents two cases: one reflecting production from existing processing facilities and two years growth of gas reserves, and the other including future facilities.

The table shows that the remaining reserves at the end of the requested permit term will be 142 million barrels for the case of existing facilities or 155 million barrels including future facilities. It also shows that the total requirements for the remainder of the thirty-year period will be 79 million barrels. This results in a surplus of the then remaining reserves over the requirements for the remainder of the period of protection of 63 million barrels for the case of existing facilities or 76 million barrels including future facilities. While the question may arise as to whether a sufficient portion of the reserves can be produced to satisfy the requirements for the remainder of the period of protection, the possibility of the use of propane storage during the years just prior to 1987 and over the remainder of the thirty-year period, and the possibility that if necessary production can be to some extent deferred, convinces the Board that the requirements for the remainder of the thirty years can be satisfied with the reserves remaining at the end of 1987.

TABLE C-1

PROPANE SURPLUS AS ESTIMATED BY THE BOARD NOT INCLUDING THE QUANTITIES APPLIED FOR

(MILLIONS OF BARRELS)

	FROM EXISTING PLANT FACILITIES		INCLUDING FUTURE PLANT FACILITIES	
PROPANE RESERVES				
RESERVES FROM ESTABLISHED GAS RESERVES	386		441	
RESERVES FROM TWO YEARS GROWTH OF GAS RESERVES	60		60	
TOTAL RECOVERABLE PROPANE RESERVES		446		501
PROPANE REQUIREMENTS				
THIRTY-YEAR ALBERTA REQUIREMENTS	221		221	
EXISTING PERMIT COMMITMENTS	124		124	
TOTAL RESERVES NEEDED TO MEET ALBERTA REQUIREMENTS AND PERMIT COMMITMENTS		345		345
SURPLUS		101		156

TABLE C-2

PROPANE SUPPLY-DEMAND BALANCE ESTIMATED BY THE BOARD

NOT INCLUDING QUANTITIES APPLIED FOR

(BARRELS PER DAY)

	PRODUCTION			SURPLUS	
YEAR	FROM EXISTING PROCESSING FACILITIES AND TWO YEARS GROWTH OF GAS RESERVES	INCLUDING FUTURE PROCESSING FACILITIES AND TWO YEARS GROWTH OF GAS RESERVES	ALBERTA REQUIREMENTS AND EXISTING PERMIT COMMITMENTS	FROM EXISTING PROCESSING FACILITIES AND TWO YEARS GROWTH OF GAS RESERVES	INCLUDING FUTURE PROCESSING FACILITIES AND TWO YEARS GROWTH OF GAS RESERVES
1966	31,300	31,300	20,300	11,000	11,000
1967	37,600	37,600	29,600	8,000	8,000
1968	40,700	40,700	31,700	9,000	9,000
1969	41,100	41,100	32,700	8,400	8,400
1970	42,900	49,100	35,300	7,600	13,800
1971	42,600	48,800	36,100	6,500	12,700
1972	43,000	49,200	37,000	6,000	12,200
1973	42,700	48,800	37,700	5,000	11,100
1974	42,200	48,300	38,000	4,200	10,300
1975	41,200	47,800	38,200	3,000	9,600
1976	41,000	47,500	39,300	1,700	8,200
1977	40,800	47,300	32,200	8,600	15,100
1978	40,600	47,200	33,100	7,500	14,100
1979	40,600	47,200	34,000	6,600	13,200
1980	39,500	46,000	35,000	4,500	11,000
1981	38,400	45,000	34,700	3,700	10,300
1982	36,600	43,200	34,400	2,200	8,800
1983	35,000	41,500	34,000	1,000	7,500
1984	31,600	38,100	31,400	200	6,700
1985	29,400	35,800	30,200	-800	5,600
1986	27,400	33,700	28,800	-1,400	4,900
1987	25,900	31,500	26,600	-700	4,900
TOTAL - (MILLIONS OF BARRELS)	304	346	267	37	79

TABLE C-3

PROPANE SURPLUS REMAINING AT THE END OF THE THIRTY-YEAR PERIOD NOT INCLUDING THE QUANTITIES APPLIED FOR

(Millions of Barrels)

	From Existing Processing Plant Facilities and Two Years Growth of Gas Reserves		Including Future Processing Plant Facilities and Two Years Growth of Gas Reserves	
Total Recoverable Propane Reserves	446		501	
Production During Term of Existing Permits - to the end of 1987	304		346	
Propane Reserves Remaining at the end of 1987		142		155
Total Requirements Including Existing Permit Commitments	345		345	
Requirements During Term of Existing Permits - to the end of 1987	266		266	
Requirements for Remainder of Thirty-Year Period (1988-1995)		79		79
SURPLUS		63		76

APPENDIX D

THE APPLICATION OF HOME OIL COMPANY LIMITED FOR AUTHORIZATION FOR THE REMOVAL OF PROPANE AND THE SURPLUS WHICH WOULD RESULT IF THE APPLICATION IS GRANTED

Home applied for authorization to remove from the Province a total of 9,855,000 barrels of propane over a twenty-year term beginning March 1, 1967. The average quantity on a daily basis, removed under the applied for permit would be 1,350 barrels per day over the entire term of the permit. The propane would come from the Carstairs processing plant.

Home presented evidence at the hearing indicating that it owns or controls some 65 per cent of the portion of the Carstairs processing plant propane production which results from the processing of gas from the Carstairs Elkton Unit and some 38 per cent of the propane which results from the processing of gas from the Crossfield Turner Valley Unit No. 1. When these percentages are applied to the Board's projected propane production for the Carstairs processing plant, Home's share of the production is such that, on the basis of the rules respecting the relationship of volumes under contract to permit volumes as set out in pages 47 and 48 of OGCB Report 65-11(1), it qualifies for the requested volume of 1,350 barrels per day for the initial 17 years of the proposed permit term. However, the volumes it would qualify for over the final three years are 1,260, 1,120 and 970 barrels per day respectively. Accordingly, the Board will consider the impact on the Provincial surplus of the application adjusted to incorporate the lower quantities over the final three years.

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(1) Report on the Applications for Permits authorizing the Removal of Propane from the Province of Canadian Hydrocarbons Limited and The British American Oil Company Limited under The Gas Resources Preservation Act, 1956. September 1965.

Table C-1 has shown that the propane reserves available from existing processing plant facilities are some 101 million barrels greater than the thirty-year requirements of the Province and the permit commitments. If the adjusted application volumes are provided for (9.6 million barrels), a surplus of some 91 million barrels remains. If the propane reserves associated with future processing facilities are considered, the overall surplus is reduced from the 156 million barrels shown in Table C-1 to 146 million barrels.

Balance on a Year by Year Basis

Table D-1 has been prepared to determine if the possible permit quantities are surplus on a year by year basis to Alberta's requirements and the permit commitments. The table presents two cases: one reflecting propane production from established reserves and existing recovery facilities plus two years growth of gas reserves, and the other including production from future processing facilities. The table covers the years 1966 to 1987 inclusive which are set out in column 1. Columns 2 and 3 have been taken from Table C-2 of this report and show the propane surplus to Alberta's requirements and the permit commitments as projected by the Board for the two previously mentioned cases. Column 4 shows the adjusted volumes requested by Home and columns 5 and 6 present the resulting surplus for each case. The surplus has been rounded to the nearest 100 barrels per day.

The table shows that for the case of existing facilities plus two years growth of gas reserves, the possible permit quantities can be satisfied and a surplus of greater than 6,000 barrels per day will exist in the early years of the period under study. The surplus will then gradually decline to a more or less balanced situation by 1983 and a deficit is predicted for the years 1984 to 1987 inclusive. If production from future facilities is included a surplus results throughout the entire period of the study. The surplus will decline from some 11,000 barrels per day in 1966 to about 7,000 barrels per day for the following three years. It will then increase to over 12,000 barrels per day in 1970 and thereafter will decline to some 4,000 barrels per day by 1986, the final year of the proposed permit term.

Balance for Remainder of Thirty-year Period

Table D-2 is a comparison of the remaining propane reserves as of the end of 1987 with the total requirements of the Province for the remainder of the thirty-year period, 1988 to 1995 inclusive. The table presents two cases: one reflecting production from existing processing facilities and two years growth of gas reserves, and the other including future processing facilities.

The table shows that the reserves remaining at the end of the period studied in detail in Table D-1 will be 142 million barrels for the case of existing facilities or 155 million barrels including future processing facilities. It also shows that the total requirements for the remainder of the thirty-year period will be 79 million barrels. This results in a surplus of the then remaining reserves over the requirements for the remainder of the period of protection of 63 million barrels for the case of existing facilities or 76 million barrels including future processing facilities. Having in mind the possibility of the use of propane storage or the deferment of production, the Board is satisfied that the requirements for the portion of the thirty-year period not studied in detail can be satisfied with the reserves remaining at the end of 1987.

TABLE D-1

PROPANE SURPLUS IF THE APPLICATION WERE GRANTED

(BARRELS PER DAY)

(1)	(2)	(3)	(4)	(5)	(6)
	SURPLUS PRIOR TO CONSIDERING APPLICATION(1)			REMAINING SURPLUS	
YEAR	FROM EXISTING PROCESSING PLANT FACILITIES AND TWO YEARS GROWTH OF GAS RESERVES	INCLUDING FUTURE PROCESSING FACILITIES AND TWO YEARS GROWTH OF GAS RESERVES	ADJUSTED HOME APPLICATION(2)	FROM EXISTING PROCESSING PLANT FACILITIES AND TWO YEARS GROWTH OF GAS RESERVES	INCLUDING FUTURE PROCESSING FACILITIES AND TWO YEARS GROWTH OF GAS RESERVES
1966	11,000	11,000	-	11,000	11,000
1967	8,000	8,000	1,350	6,700	6,700
1968	9,000	9,000	1,350	7,700	7,700
1969	8,400	8,400	1,350	7,100	7,100
1970	7,600	13,800	1,350	6,300	12,500
1971	6,500	12,700	1,350	5,200	11,400
1972	6,000	12,200	1,350	4,700	10,900
1973	5,000	11,100	1,350	3,700	9,800
1974	4,200	10,300	1,350	2,900	9,000
1975	3,000	9,600	1,350	1,700	8,300
1976	1,700	8,200	1,350	400	6,900
1977	8,600	15,100	1,350	7,300	13,800
1978	7,500	14,100	1,350	6,200	12,800
1979	6,600	13,200	1,350	5,300	11,900
1980	4,500	11,000	1,350	3,200	9,700
1981	3,700	10,300	1,350	2,400	9,000
1982	2,200	8,800	1,350	900	7,500
1983	1,000	7,500	1,350	- 400	6,200
1984	200	6,700	1,260	-1,100	5,400
1985	-800	5,600	1,120	-1,900	4,500
1986	-1,400	4,900	970	-2,400	3,900
1987	-700	4,900	-	-700	4,900

(1) FROM TABLE C-2

(2) ADJUSTED ON BASIS OF PROPANE OWNED OR CONTROLLED BY HOME

TABLE D-2

PROPANE SURPLUS REMAINING AT THE END OF THE THIRTY-YEAR PERIDD IF THE APPLICATION WERE GRANTED

(Millions of Barrels)

	From Existing Plant Facilities and Two Years Growth of Gas Reserves		Including Future Plant Facilities and Two Years Growth of Gas Reserves	
Total recoverable propane Reserves	446		501	
Production during term of existing permits - to the end of 1987	304		346	
Propane Reserves remaining at the end of 1987		142		155
Total requirements including existing and requested permit commitments	355		355	
Requirements during term of existing permits - to the end of 1987	276		276	
Requirements for remainder of thirty-year period (1988-1996)		79		79
SURPLUS		63		76

APPENDIX E

IN THE MATTER of The Gas Resources
Preservation Act, 1956, being
chapter 19 of the Statutes of
Alberta, 1956; and

IN THE MATTER of a Permit to Home
Oil Company Limited

PERMIT NO. HO 66-1

WHEREAS Home Oil Company Limited (hereinafter called "the Permittee") has applied to the Oil and Gas Conservation Board for a permit pursuant to The Gas Resources Preservation Act, 1956, for the removal from the Province of propane produced at the gas processing plant hereinafter referred to; and

WHEREAS the Board, upon inquiry into and hearing of the application, has found that the Permittee is a person who produces or has the right to produce propane within the Province and who appears to the Board to have made arrangements giving it the exclusive right to dispose of propane and who proposes to remove propane, or cause it to be removed, from the Province, and that the provisions of the said Act affecting the application have been complied with; and

WHEREAS the Board is of the opinion that the granting of this Permit for the removal of propane from the Province is in the public interest having regard to the present and future needs of persons within the Province, and to the established reserves and trends in growth and discovery of the reserves of gas or propane in the Province; and

WHEREAS the Lieutenant Governor in Council has given his approval by Order in Council numbered , and dated

THEREFORE, the Oil and Gas Conservation Board, pursuant to the provisions of The Gas Resources Preservation Act, 1956, hereby grants a Permit to Home Oil Company Limited, and hereby authorizes the removal of propane from the Province, subject to the regulations and orders made pursuant to the provisions of the said Act and to the terms and conditions prescribed in this Permit, as follows:

1. Subject to the conformity by the Permittee with the terms and conditions hereof, this Permit shall be operative for a term commencing on March 1, 1967, and ending on February 28, 1987.

2. The quantity of propane that may be removed from the Province pursuant to this Permit shall not exceed in any of the following twelve-month periods the maximum quantity prescribed for that period as follows:

Twelve-Month Period	Maximum Quantity
March 1, 1967 to February 29, 1968	492,750 barrels
March 1, 1968 to February 28, 1969	492,750 barrels
March 1, 1969 to February 28, 1970	492,750 barrels
March 1, 1970 to February 28, 1971	492,750 barrels
March 1, 1971 to February 29, 1972	492,750 barrels
March 1, 1972 to February 28, 1973	492,750 barrels
March 1, 1973 to February 28, 1974	492,750 barrels

March 1, 1974 to February 28, 1975	492,750 barrels
March 1, 1975 to February 29, 1976	492,750 barrels
March 1, 1976 to February 28, 1977	492,750 barrels
March 1, 1977 to February 28, 1978	492,750 barrels
March 1, 1978 to February 28, 1979	492,750 barrels
March 1, 1979 to February 29, 1980	492,750 barrels
March 1, 1980 to February 28, 1981	492,750 barrels
March 1, 1981 to February 28, 1982	492,750 barrels
March 1, 1982 to February 28, 1983	492,750 barrels
March 1, 1983 to February 29, 1984	492,750 barrels
March 1, 1984 to February 28, 1985	459,900 barrels
March 1, 1985 to February 28, 1986	408,800 barrels
March 1, 1986 to February 28, 1987	354,050 barrels

3. The Permittee, for the purpose of this Permit, may purchase or otherwise acquire for removal from the Province, and there may be removed from the Province under the authority of this Permit, only propane obtained from the processing of gas at the Carstairs gas processing plant, located on Legal Subdivisions 2 and 7 and the South-west quarter of Section 3, Township 30, Range 2, West of the 5th Meridian.

4. (1) If, during the term of the Permit, the Permittee gives or receives notice of cancellation of any contract under which it is given the exclusive right to dispose of propane produced at the processing plant named in clause 3 of these terms and conditions, it shall forthwith notify the Board of the notice.

(2) Upon notification by the Permittee pursuant to subclause (1) or one month before cancellation of a contract pursuant to a notice referred to in subclause (1), whichever is later, the Board, by stipulation, shall reduce the volumes of propane that may be removed from the Province pursuant to this Permit during the balance of the term of the Permit by the volumes that the Permittee would have disposed of under the contract if it had not been cancelled; but if the Permittee, before the issue of the stipulation, satisfies the Board that it has made an arrangement whereby it will acquire volumes of propane at the processing plant named in clause 3 of these terms and conditions, or the exclusive right to dispose of such volumes, to replace in whole or in part the propane that it would have disposed of under the cancelled contract, then the volumes of propane that may be removed from the Province pursuant to this Permit shall not be reduced or shall be reduced only to the extent that the volumes of propane that the Permittee would have disposed of under the cancelled contract have not been replaced, as the case may be.

5. Propane produced at processing plants other than that named in clause 3 of these terms and conditions acquired in Alberta by the Permittee may be removed from the Province under the authority of this Permit

(a) over a period of not more than three months in any year commencing March 1, and

(b) in daily average volumes over the period

not exceeding one-tenth of the volume
that could be removed from the Province
pursuant to this Permit if the annual volume
were divided equally among the days in the
year,

in substitution for equal volumes of propane produced at the plant named in said clause 3, and the Permittee shall notify the Board of the substitution within ten days of its commencement.

6. The effective commencement of removal of propane from the Province pursuant to this Permit shall be on or before September 1, 1967, unless, upon application by the Permittee, a later date is stipulated by the Board.

7. (1) All propane removed from the Province pursuant to this Permit shall be measured by or on behalf of the Permittee within the Province and in a manner satisfactory to the Board.

(2) The measurements required by this clause shall be reported monthly to the Board in a manner approved by the Board.

8. (1) The Permittee shall supply propane at a reasonable price to any community or consumer within the Province that is willing to take delivery of propane at the gas processing plant named in clause 3 of these terms and conditions and that, in the opinion of the Board, can reasonably be supplied by the Permittee.

(2) In the event that propane is removed from the

Province pursuant to this Permit by pipe line, the Permittee shall supply propane at a reasonable price to any community or consumer within the Province that is willing to take delivery of propane at a point on the pipe line transmitting the propane within the Province, and that, in the opinion of the Board, can reasonably be supplied by the Permittee.

9. If any community or consumer is willing to take delivery of propane pursuant to clause 8 of these terms and conditions, and agreement on the price to be paid for the propane cannot be reached, the price to be paid shall be determined by the Public Utilities Board on the application of an interested party.

10. Notwithstanding the provisions hereof, the Permittee shall comply with the provisions of any Act, competent regulation, order or direction governing the production, conservation, transportation, processing, purchasing, acquisition, sale, measurement, reporting, testing, supply or delivery of propane within the Province.

MADE at the City of Calgary, in the Province of Alberta, this day of A.D. 1966.

OIL AND GAS CONSERVATION BOARD

G. W. Govier

Chairman